



Defining the Minimum Information Model

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with Systems Integration Division

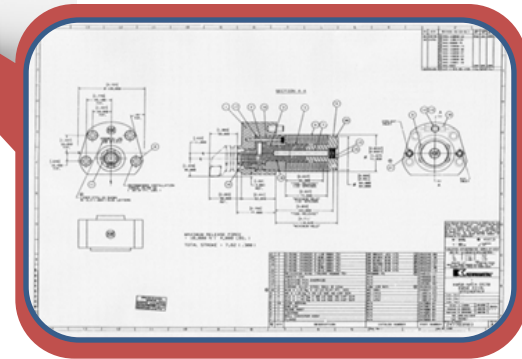
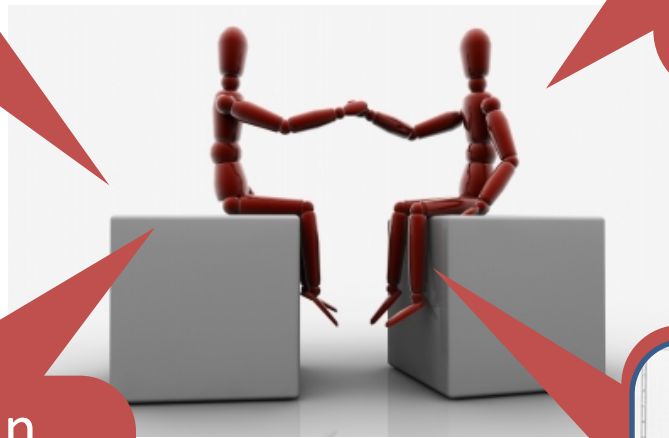
The industrial collaboration journey...

Yesterday

Communications
often in serial
fashion

You trusted the
data because you
trusted the person
that generated
the data

Collaboration
meant face-to-
face
communication



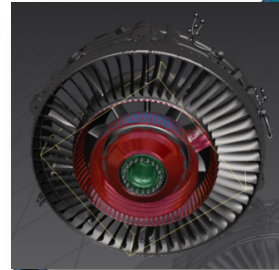
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The industrial collaboration journey...

Tomorrow

The **digital product definition** becomes the *conduit* in a standards-based communication process.

The product *model* is the basis for a **secure, authoritative** source of product definition.



You come to *trust the process* that generates product data (because the person may be unknown).



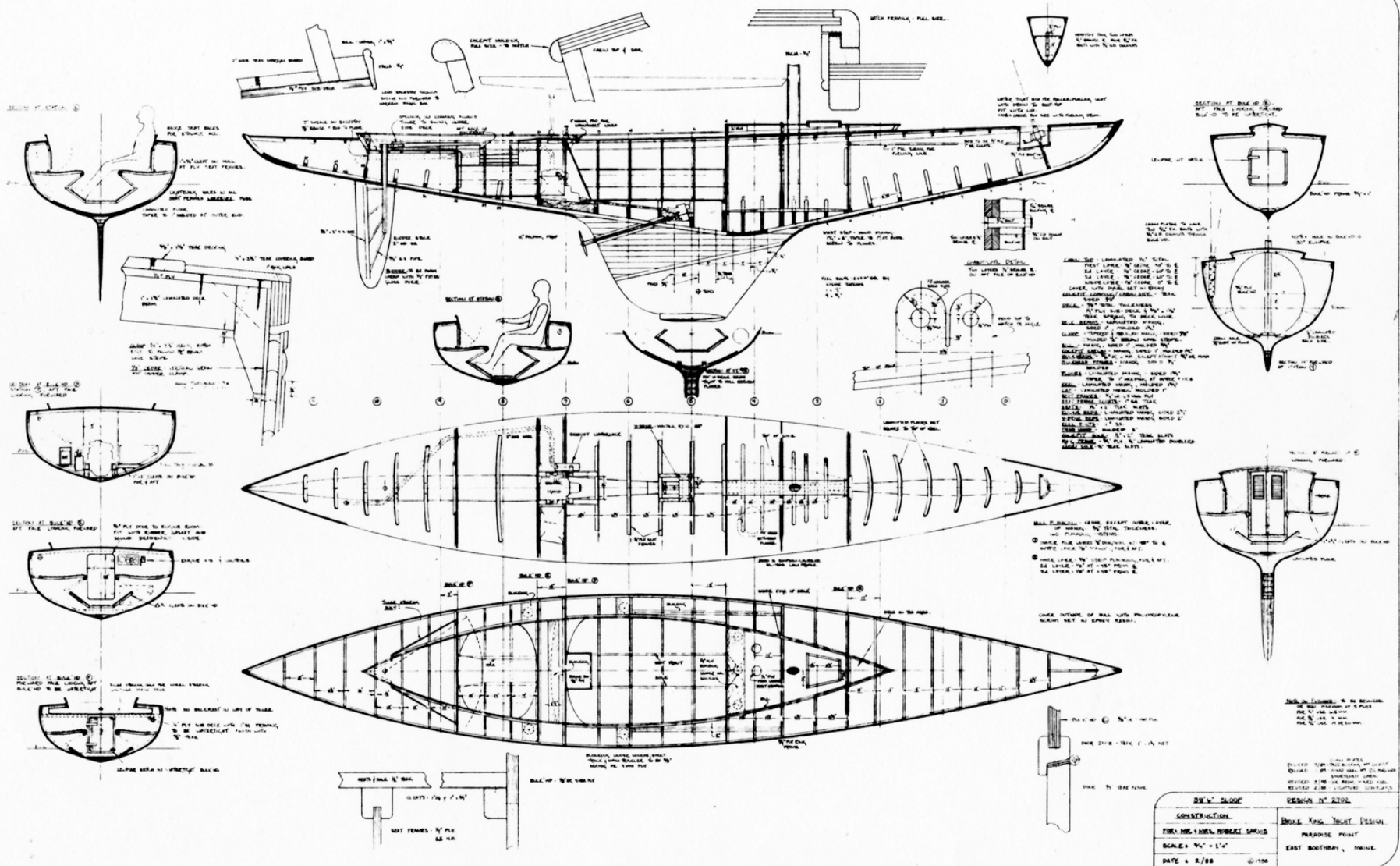
PRODUCT LIFECYCLE MANAGEMENT
CENTER OF EXCELLENCE

PURDUE
POLYTECHNIC

Ongoing industrial challenges

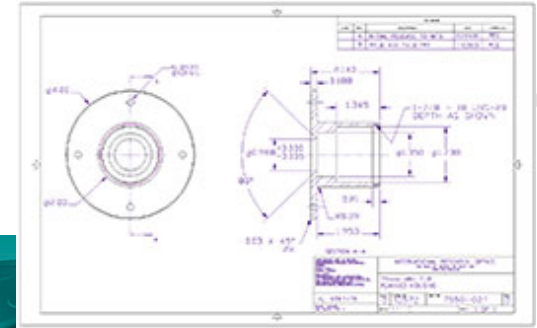
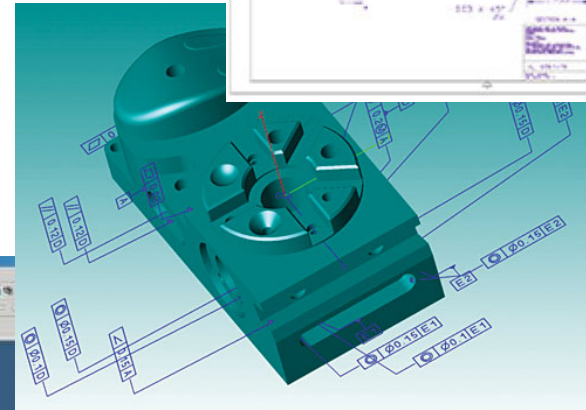
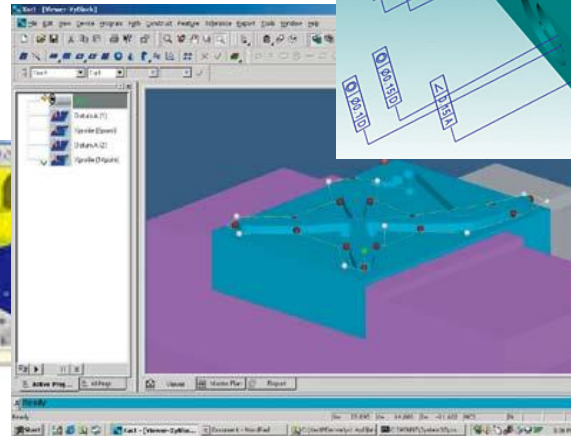
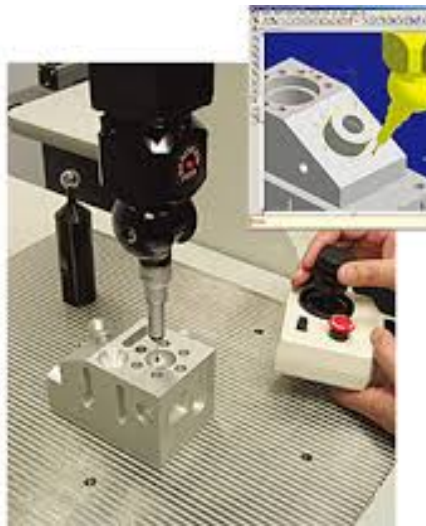
- Driving product lifecycle data with high fidelity representations
- Global competition vs. democratization of technology?
- Design/make vs. make to print (model)?
- Product complexity: combination of mechanical, electrical, and software
- Product knowledge stored with people or artifacts?
- Mobility, Collaboration, and Interfaces → the social psychology of expertise

What did we put into drawings?



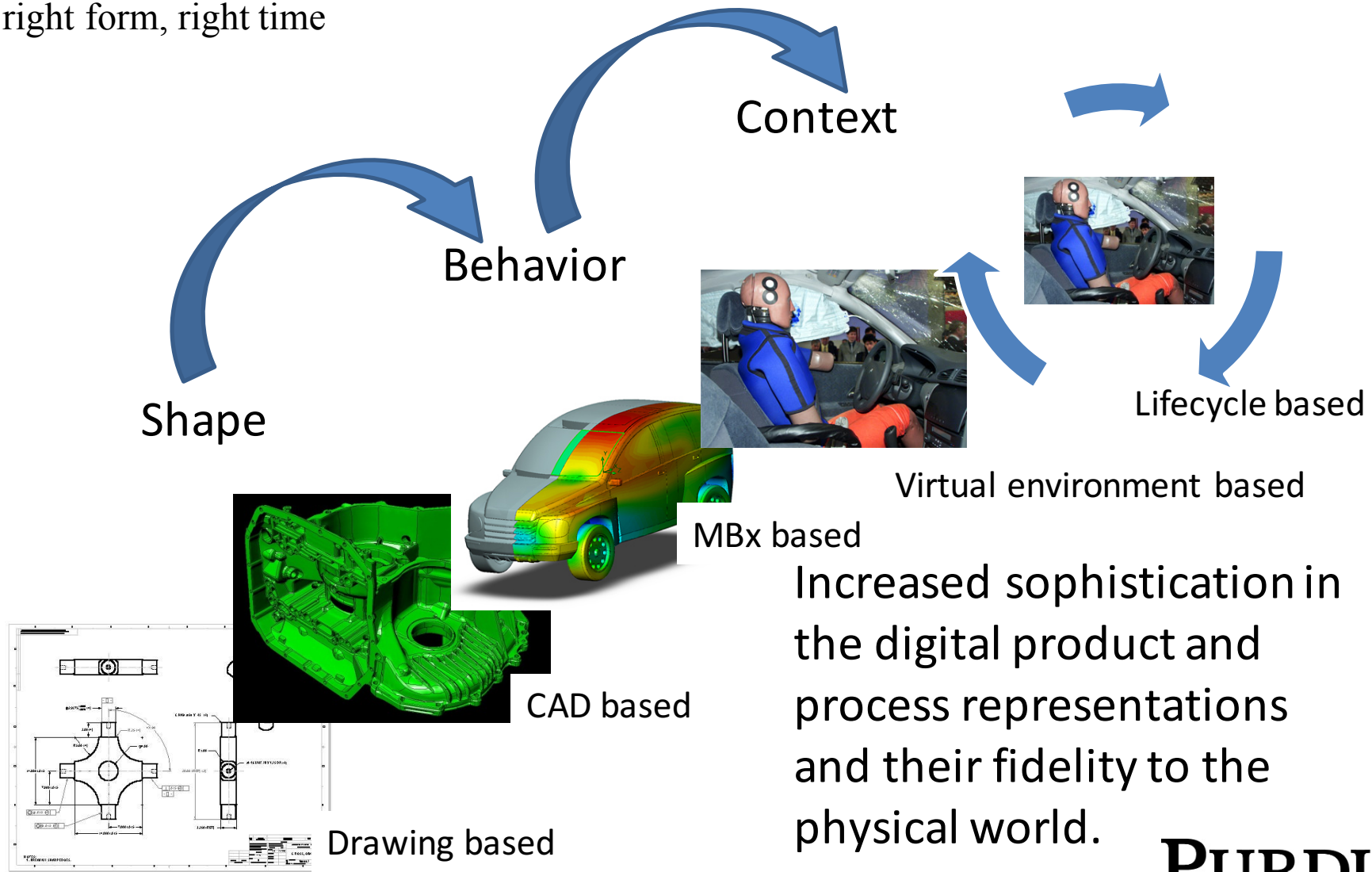
What do we put into models?

For many people, it is a matter of whether they are an author or a consumer. MBD is fundamental to the future of digital manufacturing, but it is more than a proxy for a drawing

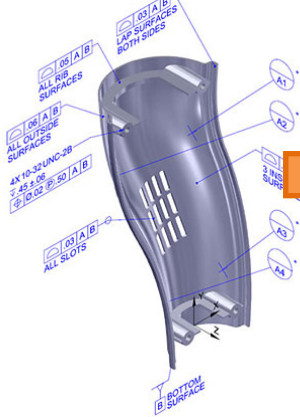


Evolution of product representations

An exercise in information flow: right place,
right form, right time



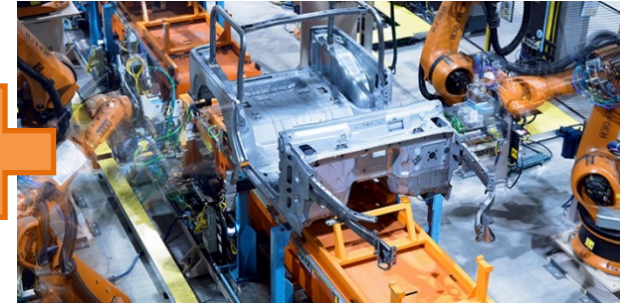
SHAPE



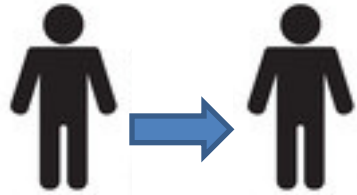
BEHAVIOR

Property	Test Standard DIN/ON EN ISO	corr.to ASTM	Unit	Value				Testing Frequency
Nominal Thickness			mm in	78 2.6 +10/-5	100 2.5 +10/-5	98 3.0 +10/-5	196 5.0 +10/-5	every hour per production run
Density (Black)	DIN EN ISO 14632	D 5994	g/cm ³	≥ 0.94				
Density (base/coloured)	ISO 1183	D792	g/cm ³	≥ 0.931/935				
Melt Flow Rate (190°/5kg) (190°/2,16kg)	ISO 1183 Cond T	D 1238 Cond E D 1238 Cond E	g/10 min	≤ 3	≤ 1	≤ 1	≤ 1	
Heat Resversion (110°C/1,5h)	DIN EN ISO 14632	D 1204 modified	%	≤ 3	≤ 3	≤ 3	≤ 2	per production run
Tensile Stress at Yield	DIN EN ISO 527	D 6693	MPa (PSI)	≥ 15 2,20	≥ 15 2,10	≥ 15 2,00	≥ 15 2,200	per production run
Elongated at Yield	DIN EN ISO 527	D 6693	%	≥ 9	≥ 9	≥ 9	≥ 9	per production run
Elongated at Break	DIN EN ISO 527	D 6693	%	≥ 300	≥ 300	≥ 300	≥ 300	per production run
Instrumented Puncture Test (Penetration Test)	ON EN ISO 6603-2	D 4833	N N (lbs)	≥ 1500 ≥ 337	≥ 1800 ≥ 625	≥ 2000 ≥ 750	≥ 2500 ≥ 1250	Approval Testing

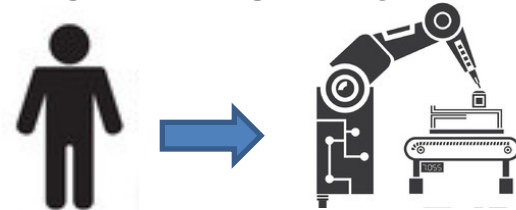
CONTEXT



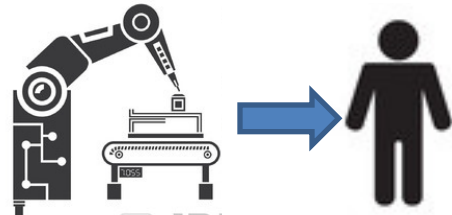
HUMAN TO HUMAN



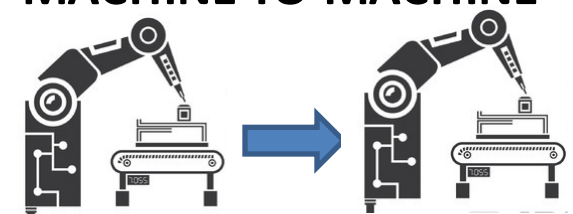
HUMAN TO MACHINE



MACHINE TO HUMAN

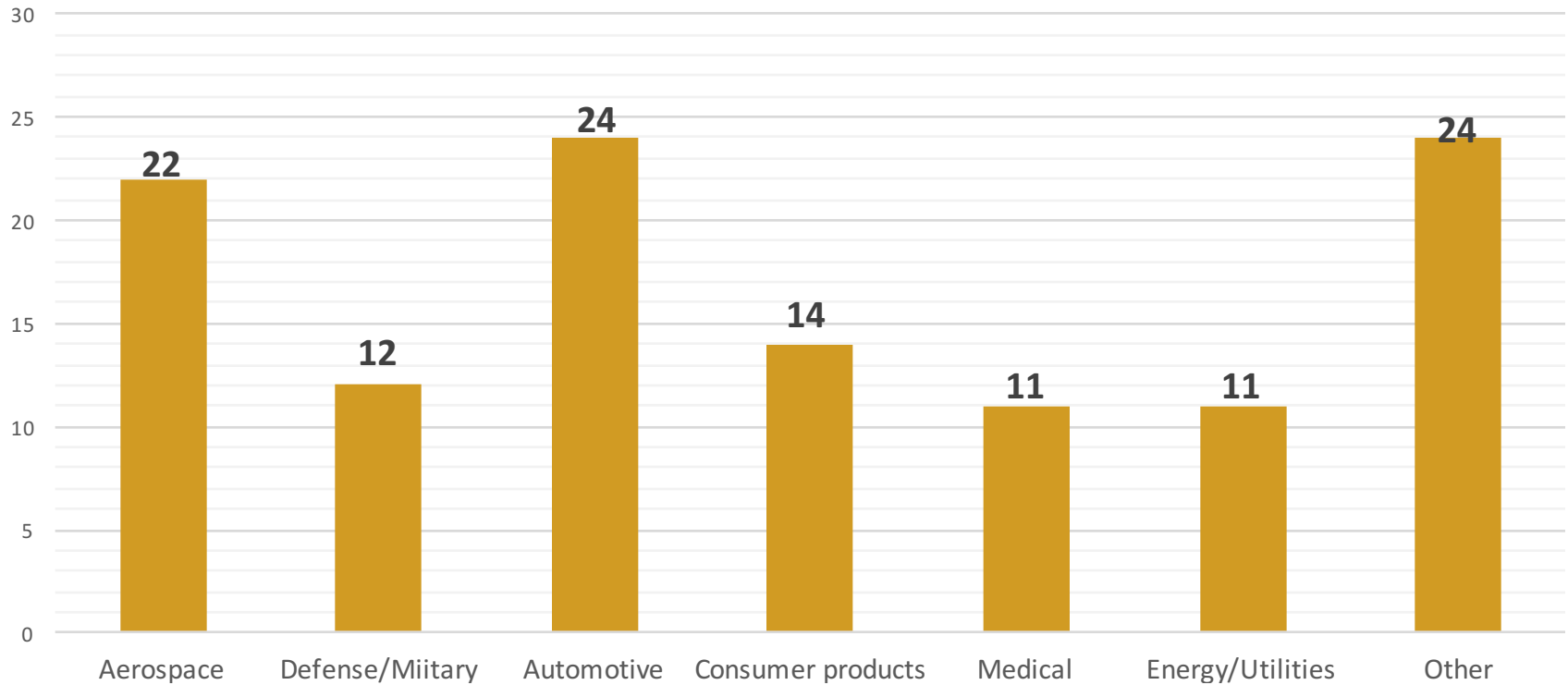


MACHINE TO MACHINE



Demographics

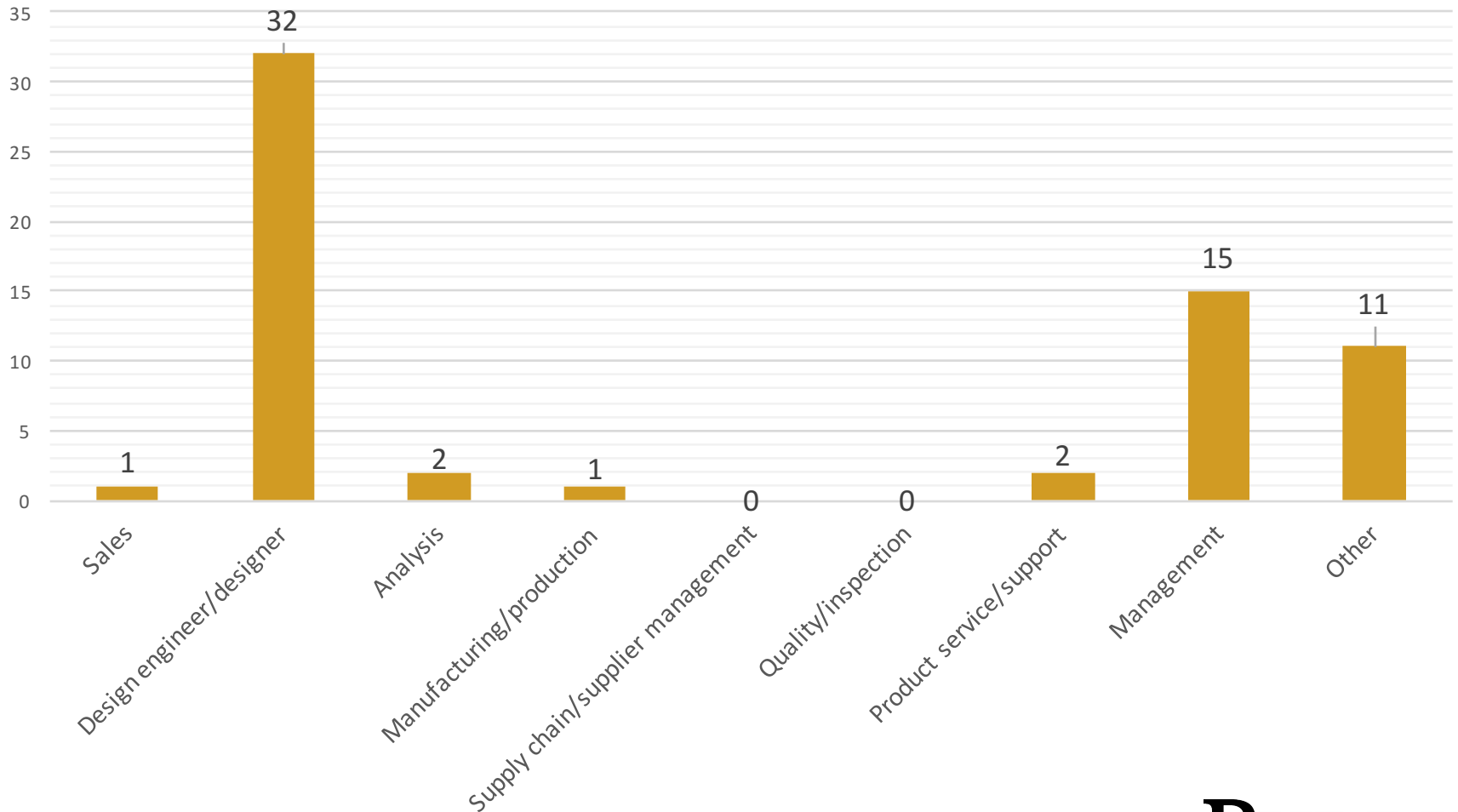
Minimum information model Industry field distribution.



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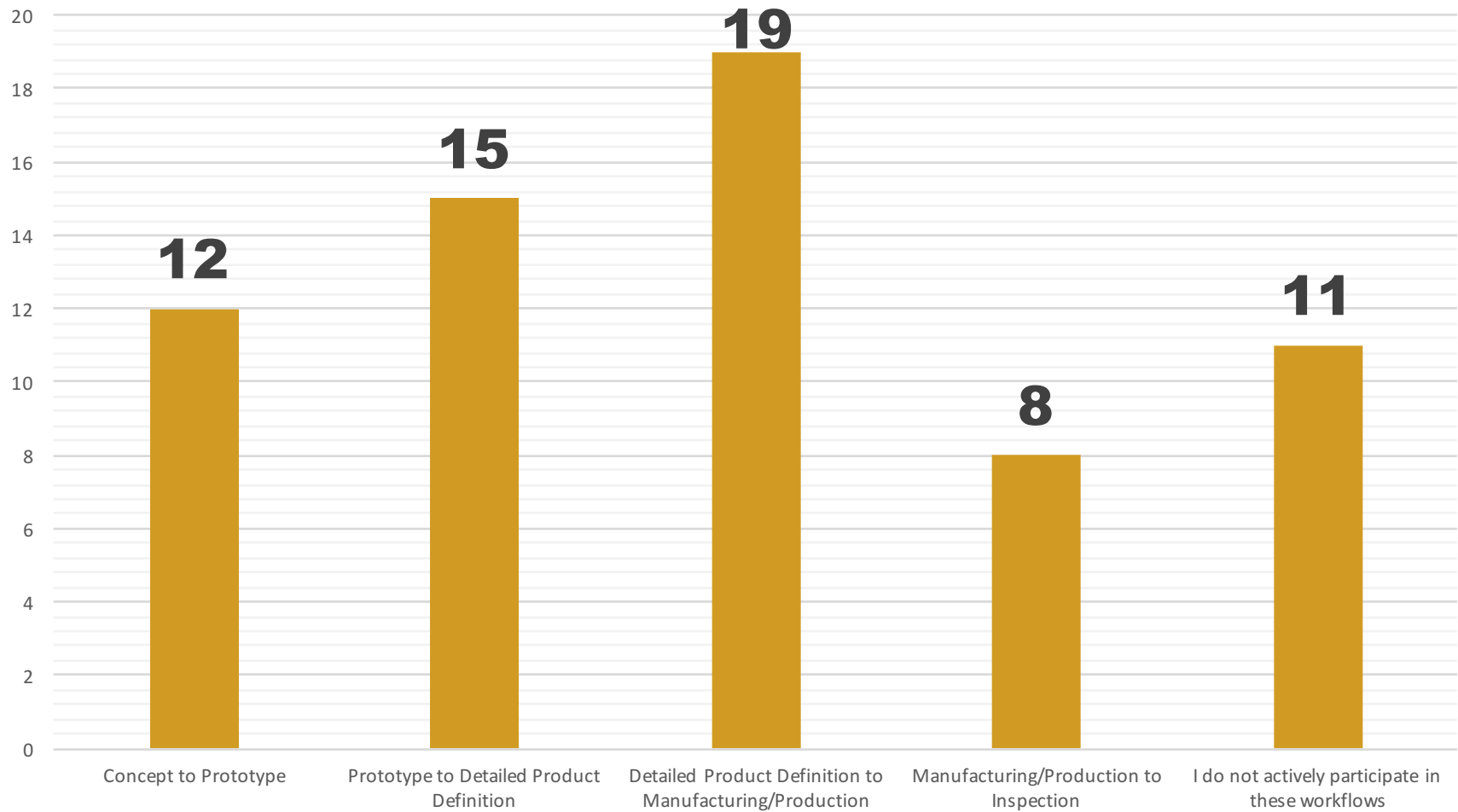
Job Area

Respondents indicated which job area they worked in.



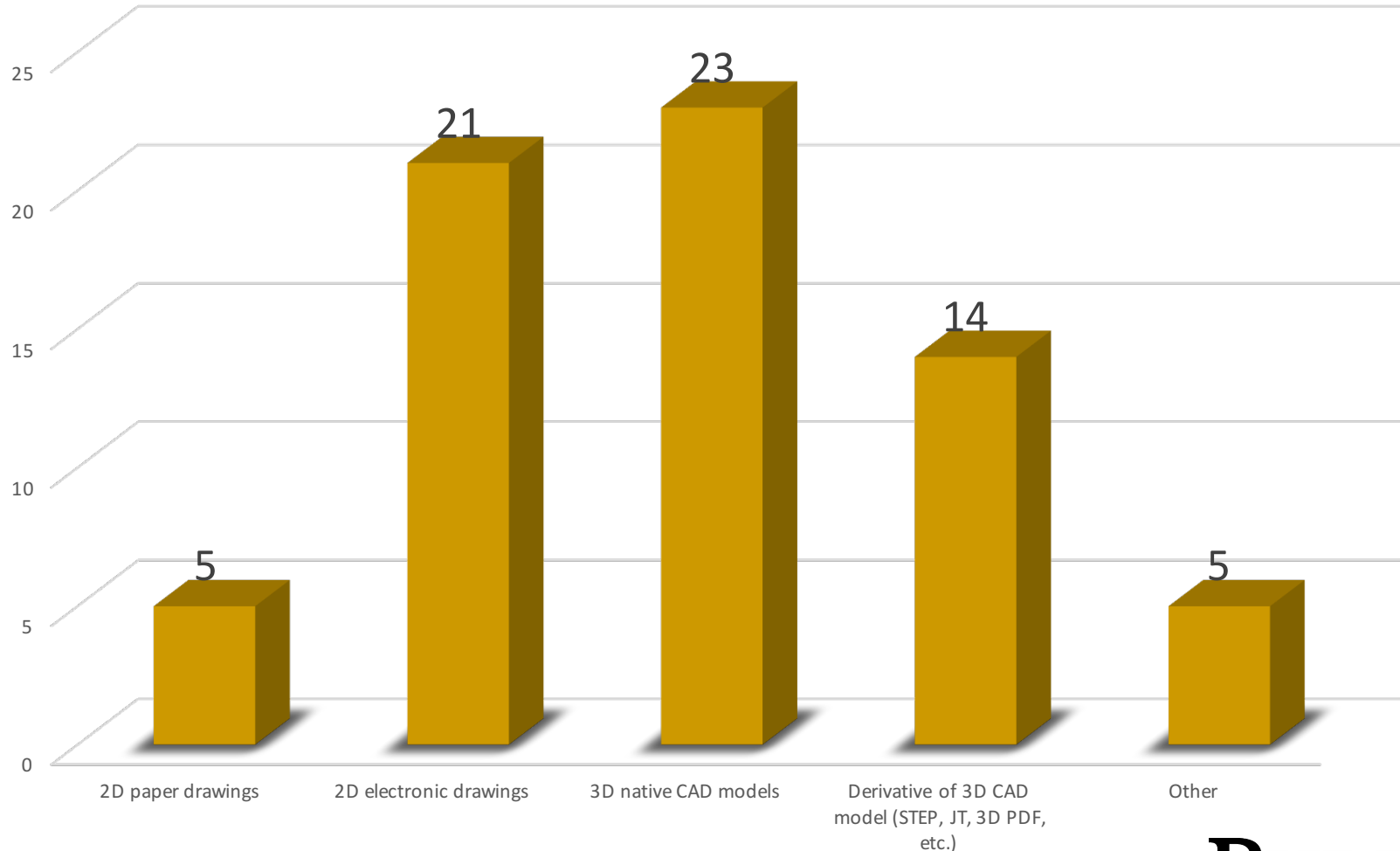
Workflow Distributions

Respondents workflow participation.



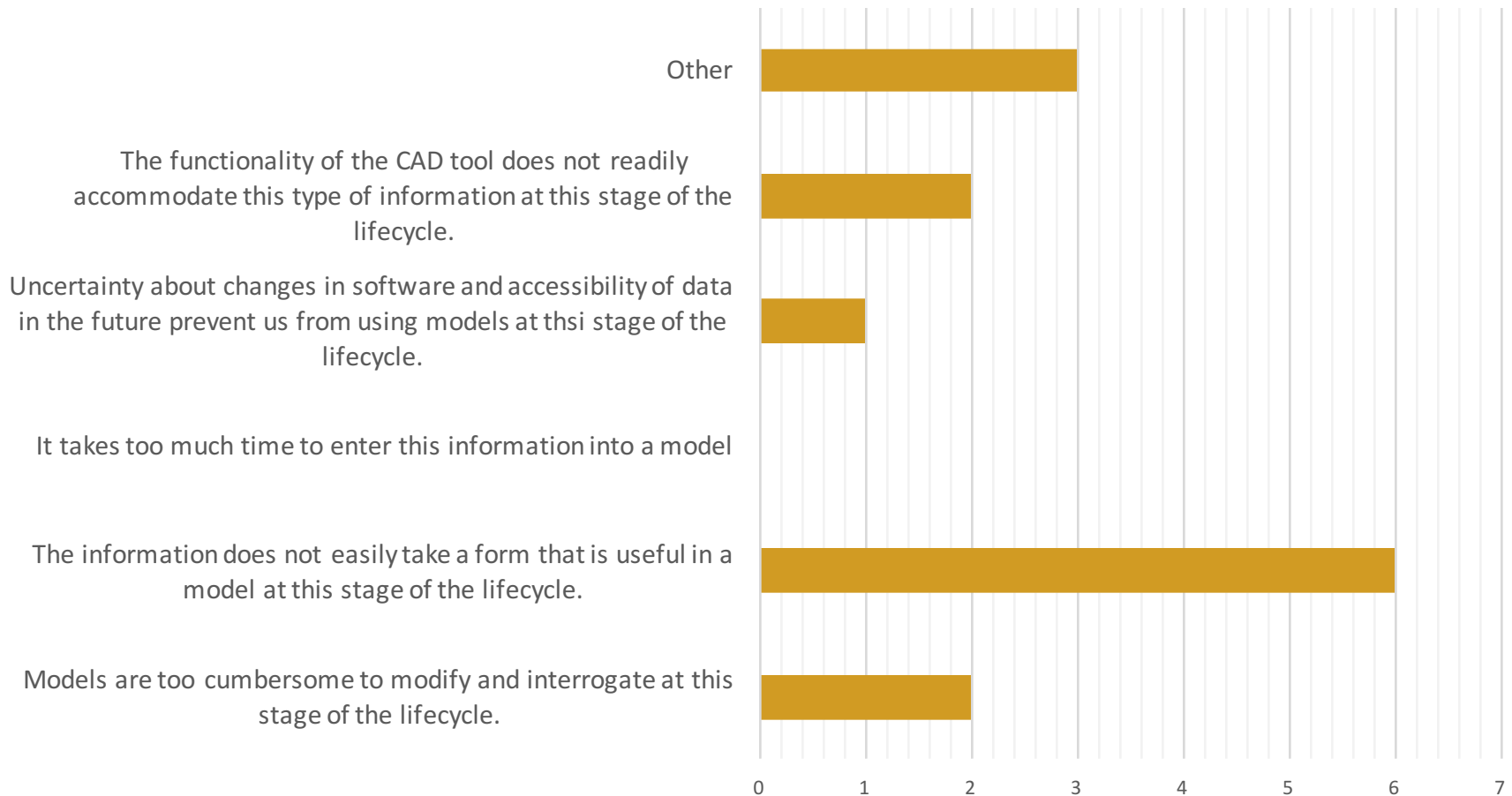
Data Exchange Medium

What best describes the format or medium in which product information comes to you for use?



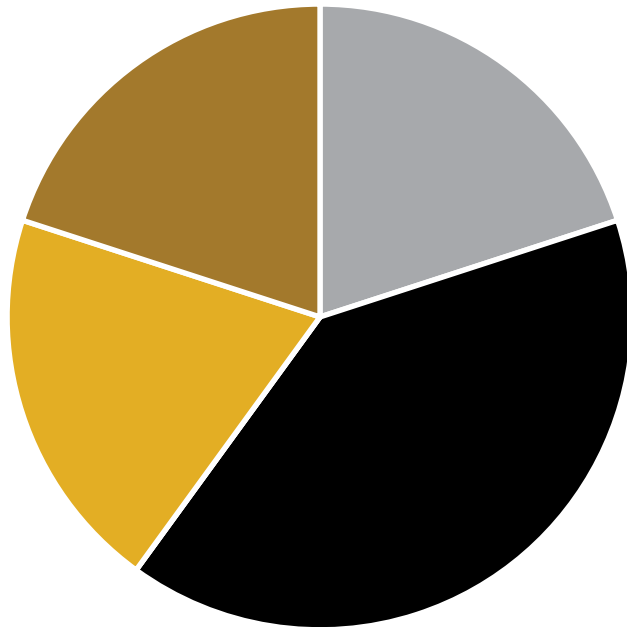
Inhibitors of MBD

Survey participants were prompted to indicate what prevents use of models if they selected that models could not be used in place of drawings.



Inhibitor of use of 3D Models in Workflow

Respondents of the various workflows were asked to select what was inhibiting the use of models in place of drawings.



- Models are too cumbersome to modify and interrogate at this stage of the lifecycle.
- The information does not easily take a form that is useful in a model at this stage of the lifecycle.
- It takes too much time to enter this information into a model.
- Uncertainty about changes in software and accessibility of data in the future prevent us from using models at this stage of the lifecycle.
- The functionality of the CAD tool does not readily accommodate this type of information at this stage of the lifecycle.

Expansion across the lifecycle

- Initial workflows were geared towards a more design → production focus
- Need to cover more of the lifecycle to give a better view
 - Design
 - Production
 - Sustainment
 - Goal of 5 workflows in each area
- Employ Delphi technique to reach consensus